Math 112
ReQuiz 12A

2022–04–08 (F)

Your name: _____

Exercise

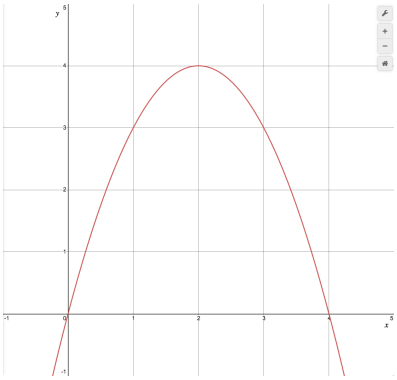
(4 pt) Let $f : \mathbf{R} \to \mathbf{R}$ be the function whose rule of assignment is

$$f(x) = -x^2 + 4x$$

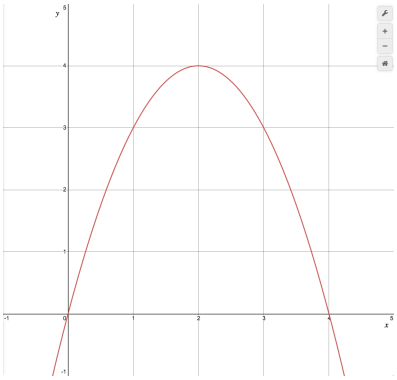
This exercise explores the area enclosed by the graph of f and the x-axis.

(a) (1 pt) Find all points where the graph of f and the x-axis intersect. Write (but do not compute) a definite integral that gives the area enclosed by the graph of f and the x-axis.

(b) (2 pt) The function f is graphed below, twice. Draw a lower sum and an upper sum, on separate graphs, each with four subintervals of length 1, to estimate the area enclosed by the graph of f and the x-axis. Compute the values L and U, respectively, of these two sums.



Lower sum (L)



Upper sum (U)

(c) (1 pt) Find an antiderivative $F(x)$ of $f(x)$. Compute the difference $F(4) - F(0)$. Compare the result to the lower and upper sum you computed in part (b).